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10/589,698	08/16/2006	Jurgen Schulz-Harder	A-10148	8806

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Welsh Flaxman & Gitler
2000 Duke Street , Suite 100
Alexandria, VA 22314

EXAMINER	
WALTERS, RYAN J	
ART UNIT	PAPER NUMBER
3726	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/589,698	SCHULZ-HARDER, JURGEN	
	Examiner	Art Unit	
	RYAN J. WALTERS	3726	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 June 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. **The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter.** See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

Claim 17 recites "at least one electric component is fastened to the plate stack or to the cooler formed by the plate stack, by means of brazing, and the component is a laser diode or light-emitting diode". However, the specification only mentions "forming a cooler or heat sink 6 for cooling an electric component, for example a laser diode bar, comprising a plurality of laser emitting diodes" (page 2) but does not mention light-emitting diode, or brazing or fastening any electric components in any way and these components do not appear in the drawings.

Claim Objections

2. **Claim 5** is objected to because of the following informalities:
On line 3, delete "treatment" which appears after "post-treatment". Appropriate correction is required.

Claim Rejections - 35 USC § 103

3. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

4. **Claims 1-7, 12-14 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto (EP 1136782A1) in view of Beltran (US 3,904,101).**

5. Re **Claim 1**, Matsumoto discloses a method for manufacturing plate stacks, for the production of coolers, cooler elements or heat sinks comprising at least one plate stack for cooling electric and/or opto-electric components, wherein the method comprises at least the following process steps:

manufacture of plates or boards of metal 1-5 (Fig. 7),

stacking of the plates to form a plate stack (Fig. 7),

joining of the plates with an application of heat at a joining temperature (TF) and at an atmospheric pressure or in a vacuum in a joining or bonding process step to form a bonded plate stack (Col. 3, paragraph 12),

cooling of the bonded plate stack formed by the joined plates to a temperature below the joining temperature (TF) (inherently the stack will cool to a lower temperature after heating step)

Matsumoto does not disclose placing of the bonded plate stack into a chamber for a post-treatment (HIP treatment) of the plate stack in an inert gas atmosphere at an inert gas pressure (PB) between 200 and 2000 bar, and at a post-treatment temperature (TB) that is below the joining temperature (TF).

However, **Beltran** teaches a method including joining of plates with the application of heat at a joining temperature (TF) (Col. 2, lines 25-67) and then placing of the bonded plate stack into a chamber for a post-treatment (HIP treatment) of the plate stack in an inert gas atmosphere at an inert gas pressure (PB) between 200 and 2000 bar, and at a post-treatment temperature (TB) that is below the joining temperature (TF) (Col. 2, line 66 – Col. 3, line 40).

It would be obvious to one of ordinary skill in the art to perform post-treatment (HIP treatment) of the plate stack at a post-treatment temperature (TB) that is below the joining temperature, as taught by Beltran, for the purpose of precluding remelting of the braze alloy and disruption of seam integrity (Col. 3, line 2) and to obtain a more secure bond by the interdiffusion of molecules across the interface between plates (Col. 3, line 38).

6. Re **Claims 2-5**, Matsumoto does not disclose of the plate stack is conducted in an inert gas atmosphere at a gas pressure between 200 and 2000 bar, and at a treatment temperature (TB) corresponding to approximately 95-99% of the temperature at which all components of the brazing metal forming the joining connection have solidified.

However, **Beltran** teaches post-treatment of the plate stack is conducted in an inert gas atmosphere at a gas pressure between 200 and 2000 bar, and at a treatment temperature (TB) corresponding to approximately 95-99% of the temperature at which all components of the brazing metal forming the joining connection have solidified. (Col. 2, line 66 – Col. 4, line 5).

It would be obvious to one of ordinary skill in the art to perform post-treatment (HIP treatment) of the plate stack at a gas pressure between 200 and 2000 bar, and at a treatment temperature (TB) corresponding to approximately 95-99% of the temperature at which all components of the brazing metal forming the joining connection have solidified, as taught by Beltran, for the purpose of precluding remelting of the braze alloy and disruption of seam integrity (Col. 3, line 2) and to obtain a more secure

bond by the interdiffusion of molecules across the interface between plates (Col. 3, line 38).

7. Re **Claim 6**, Matsumoto discloses a joining material is applied at least to the surface sides of the plates to be joined (Col. 3, paragraph 12).

8. Re **Claim 7**, Matsumoto discloses application of a brazing metal as joining material to the plates (Col. 3, paragraph 12),

stacking of the plates to form the plate stack (Fig. 7),

heating of the plate stack at least to the melting temperature of the brazing metal (Col. 3, paragraph 12),

cooling of the plate stack to a temperature below the melting temperature of the brazing metal (inherent), and

Beltran teaches HIP post-treatment of the plate stack (Taught by Beltran, already discussed in claim 1 rejection).

9. Re **Claim 12**, as best understood, Matsumoto does not disclose the joining of the plates takes place with the application of heat at a mechanic pressing force between 20 and 2500 bar. **Beltran** teaches application of heat at a mechanic pressing force between 20 and 2500 bar (Col. 2, lines 25-65).

It would be obvious to one of ordinary skill in the art to perform application of heat at a mechanic pressing force between 20 and 2500 bar, as taught by Beltran, for the purpose of ensuring that the plates are pushed so as to closely conform to one another (Col. 2, lines 52-55).

10. Re **Claim 13**, Matsumoto discloses the plates are made of copper and that silver is used as the joining material, forming together with the adjoining copper a silver-copper alloy, that in order to join the plate stack (Col. 15, paragraph 90), the stack is heated (Col. 3, paragraph 12).

Matsumoto does not explicitly disclose heating to a temperature between 778 and 990.degree. C.. However, Matsumoto discloses heating to a temperature above the melting point of the joining material (Col. 3, paragraph 12). It would be obvious to heat in this range in order to effectively allow the joining material to bond the plates and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Matsumoto does not disclose the HIP post-treatment takes place at a pressure between 400 and 2000 bar at a post-treatment temperature of at least 252.degree. C. and no more than 767.degree. C.

However, **Beltran** teaches HIP post-treatment of the plate stack at a pressure between 400 and 2000 bar, and at a post-treatment temperature below the prior brazing temperature (Col. 2, line 66 – Col. 3, line 40).

It would be obvious to one of ordinary skill in the art to perform post-treatment (HIP treatment) of the plate stack at a gas pressure between 200 and 2000 bar, and at a post-treatment temperature below the prior brazing temperature, as taught by Beltran, for the purpose of precluding remelting of the braze alloy and disruption of seam integrity (Col. 3, line 2) and to obtain a more secure bond by the interdiffusion of

molecules across the interface between plates (Col. 3, line 38) and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

11. Re **Claim 14**, Matsumoto discloses the plates are made of copper and that silver is used as the joining material, forming together with the adjoining copper a silver-copper alloy, that in order to join the plate stack (Col. 15, paragraph 90), the stack is heated (Col. 3, paragraph 12).

Matsumoto does not explicitly disclose heating to a temperature of approximately 850.degree. C. However, Matsumoto discloses heating to a temperature above the melting point of the joining material (Col. 3, paragraph 12). It would be obvious to heat in this range in order to effectively allow the joining material to bond the plates and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Matsumoto does not disclose the HIP post-treatment takes place at a pressure approximately 1200 bar at a post-treatment temperature of at least 408.degree. C. and no more than 877.degree. C.

However, **Beltran** teaches HIP post-treatment of the plate stack at a pressure approximately 1200 bar, and at a post-treatment temperature below the prior brazing temperature (Col. 2, line 66 – Col. 3, line 40).

It would be obvious to one of ordinary skill in the art to perform post-treatment

(HIP treatment) of the plate stack at a gas pressure approximately 1200 bar, and at a post-treatment temperature below the prior brazing temperature, as taught by Beltran, for the purpose of precluding remelting of the braze alloy and disruption of seam integrity (Col. 3, line 2) and to obtain a more secure bond by the interdiffusion of molecules across the interface between plates (Col. 3, line 38) and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

12. Re **Claim 18**, Matsumoto discloses a joining material is applied to surfaces of at least some openings (Col. 15, paragraph 90).

13. **Claims 8-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto (EP 1136782A1) in view of Beltran (US 3,904,101), as applied to Claim 1, in further view of Woodfield (US 6,737,017).**

14. Re **Claims 8 and 9**, Matsumoto does not explicitly disclose that during the HIP post-treatment an inert gas atmosphere formed by argon or nitrogen with a maximum oxygen content is used that amounts to approximately 300% of the oxygen content corresponding to the equilibrium oxygen partial pressure at the treatment temperature (TB) or that the oxygen content in the inert gas atmosphere is less than an oxygen partial pressure of 15.times.10.sup.-6 bar.

However, **Beltran** teaches during the HIP post-treatment an inert gas atmosphere formed by argon or nitrogen with a maximum oxygen content is used (Col. 3, lines 12-40). It would be obvious to one of ordinary skill in the art to perform post-

treatment (HIP treatment) of the plate stack with argon, as taught by Beltran, for the purpose of precluding remelting of the braze alloy and disruption of seam integrity (Col. 3, line 2) and to obtain a more secure bond by the interdiffusion of molecules across the interface between plates (Col. 3, line 38). Further, **Woodfield** teaches a hot isostatic pressing method including a residual oxygen content which can diffuse into and alloy with the metallic component showing that it is beneficial to have a maximum oxygen content during an HIP step (Col. 11, lines 20-25). It would be obvious to ordinary skill in the art to have a maximum oxygen content during an HIP step, as taught by Woodfield, for the purpose of achieving further alloying of a metallic article (Col. 11, line 21) and also since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

15. **Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto (EP 1136782A1) in view of Beltran (US 3,904,101), as applied to Claim 1, in further view of Gaddis (US 2,726,681).**

16. Re **Claims 10-11**, Matsumoto discloses application or creation of a joining material on the plates made of metal (Col. 15, paragraph 90),
heating after stacking to a temperature above the melting point of the joining material (Col. 3, paragraph 12).

Matsumoto does not disclose using copper-oxide layer as the joining material and heating at a temperature between 1065 and 1083 degree C.

However, **Gaddis** teaches application of copper-oxide as a joining material to

bond metal parts and heating to a desired temperature such that the copper oxide becomes fluid (Col. 3, lines 1-25). It would be obvious to one of ordinary skill in the art to utilize copper oxide, as taught by Gaddis, for the purpose of creating a mechanically strong bond having excellent heat transfer characteristics (Col. 3, line 19) and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Matsumoto does not disclose HIP post-treatment of the plate stack at a pressure between 200 and 2000 bar or 1000 bar, and at a post-treatment temperature of at least 390.degree. C. and no more than 1052.degree C or 1020.degree. C.

However, **Beltran** teaches HIP post-treatment of the plate stack at a pressure between 200 and 2000 bar or 1000 bar, and at a post-treatment temperature below the prior brazing temperature (Col. 2, line 66 – Col. 3, line 40).

It would be obvious to one of ordinary skill in the art to perform post-treatment (HIP treatment) of the plate stack at a gas pressure between 200 and 2000 bar, and at a post-treatment temperature below the prior brazing temperature, as taught by Beltran, for the purpose of precluding remelting of the braze alloy and disruption of seam integrity (Col. 3, line 2) and to obtain a more secure bond by the interdiffusion of molecules across the interface between plates (Col. 3, line 38) and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

17. **Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto (EP 1136782A1) in view of Beltran (US 3,904,101), as applied to Claim 1, in further view of Surty (US 3,405,323).**

18. Re **Claims 15-16**, Matsumoto discloses application or creation of a joining material on the plates made of metal (Col. 15, paragraph 90),
heating after stacking to a temperature above the melting point of the joining material (Col. 3, paragraph 12).

Matsumoto does not disclose using gold as the joining material and heating at a temperature between 880 and 1065 degree C or 1030 C.

However, **Surty** teaches application of gold as a joining material to bond metal parts by brazing (Col. 4, line 12). It would be obvious to one of ordinary skill in the art to utilize gold, as taught by Surty, for the purpose of creating a mechanically strong bond having excellent heat transfer characteristics and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Matsumoto does not disclose HIP post-treatment of the plate stack at and a pressure (PB) of 900 bar and a post-treatment temperature of at least 408.degree. C. and no more than 877.degree C or 920 C.

However, **Beltran** teaches HIP post-treatment of the plate stack at a post-treatment temperature below the prior brazing temperature (Col. 2, line 66 – Col. 3, line 40). It would be obvious to one of ordinary skill in the art to perform post-treatment (HIP treatment) of the plate stack at a gas pressure between 200 and 2000 bar, and at a

post-treatment temperature below the prior brazing temperature, as taught by Beltran, for the purpose of precluding remelting of the braze alloy and disruption of seam integrity (Col. 3, line 2) and to obtain a more secure bond by the interdiffusion of molecules across the interface between plates (Col. 3, line 38) and since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

19. **Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Matsumoto (EP 1136782A1) in view of Beltran (US 3,904,101), as applied to Claim 1, in further view of Mundinger (US 5,727,618).**

20. Re **Claim 17**, Matsumoto does not discloses at least one electric component is fastened to the plate stack or to the cooler formed by the plate stack, by means of brazing, and the component is a laser diode or light-emitting diode.

However, **Mundinger** teaches brazing a diode 155 to a plate stack 160 (Fig. 7; Col. 9, line 35). It would be obvious to one of ordinary skill in the art to braze a diode to a plate stack, as taught by Mundinger, for the purpose of properly attaching the components together and enabling the diode to function with the heat exchanger.

Response to Arguments

21. Applicant's arguments filed 6/28/2010 have been fully considered but they are not persuasive.

22. Applicant argues on page 9 that Matsumoto does not teach a post-treatment of bonded plate stack.

Note that this is taught by Beltran.

23. Applicant argues on page 10 that Beltran does not teach a post-treatment of a finished or nearly finished product and does not teach the specific pressure and temperature of claim 1.

The examiner respectfully disagrees. Beltran teaches bonding the sheet metal cladding to the substrate first (Col. 2, lines 25-66) and then post treating the assembly by Hot Isostatic Pressing (HIP) to create a more secure bond (Col. 3, lines 1-40), which is identical to the instant invention. Note that Beltran teaches a post-treatment pressure of 15 KSI (Col. 3, line 36; which equals about 1034 bar) and explicitly teaches the HIP temperature is less than the brazing temperature (Col. 3, line 1 and Col. 4, lines 1-5) and thus clearly meets the claims.

Conclusion

24. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RYAN J. WALTERS whose telephone number is (571)270-5429. The examiner can normally be reached on Monday-Friday, 9am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bryant can be reached on 571-272-4526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. J. W./
Examiner, Art Unit 3726

/DAVID P. BRYANT/
Supervisory Patent Examiner, Art Unit 3726